UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,194	12/04/2003	Andrew J. Hull	84280	2186

23523	7590	11/15/2004

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EXAMINER
SUN, XIUQIN

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 11/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>04 December 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-5</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-5</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>04/07/04</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>01/26/2004</u>.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2.   Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Lu et al. (U.S.

Pat. No. 5804727).

Lu et al. teaches a method to estimate a real and imaginary dilatational

wavespeed of a material (col. 3, lines 29-44), said method comprising the steps of:

providing a specimen of the material (col. 4, lines 11-58 and cols. 6-8, lines 34-2);

providing a source of acoustic waves at a zero wavenumher (col. 4, lines 11-58 and

cols. 6-8, lines 34-2); positioning said specimen at a distance from said source such that

said acoustic waves conform to plane waves (col. 4, lines 11-58 and cols. 6-8, lines 34-

2); exciting said specimen with said acoustic waves (col. 4, lines 11-58 and cols. 6-8,

lines 34-2); measuring transfer function data subsequent said excitation of said

specimen (col. 5, lines 18-54 and cols. 6-8, lines 34-2); calculating said transfer function

data to closed form (col. 5, lines 18-54 and cols. 6-8, lines 34-2); and determining the

real and imaginary dilatational wavespeed of said specimen from said calculated

transfer function data (cols. 5-6, lines 55-33 and cols. 6-8, lines 34-2).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu et

al. in view of Zeroug et al. (U.S. Pub. No. 20040054474).

Lu et al. teach the subject matter discussed above. Lu et al. do not mention

explicitly: exciting said specimen for at least two nonzero wavenumbers; measuring

transfer function data subsequent to the excitation of said specimen for at least two

nonzero wavenumbers; calculating said transfer function data to closed form

subsequent to said measuring step said specimen for said excitation for at least two

nonzero wavenumbers; determining an estimated real and imaginary shear wavespeed

of the material from said transfer function data calculated to closed form subsequent to

said measuring step of said specimen for said excitation for at least two nonzero

wavenumbers; obtaining a real and imaginary shear modulus of the material from said

real and imaginary determined shear wavespeed; determining a real and imaginary

Young's modulus of the material from said obtained shear modulus; and obtaining an

estimated Poisson's ratio of the material from said determined Young's modulus and

said obtained shear modulus.

Zeroug et al. teach a method for estimating the time varying mechanical properties of a material, comprising the steps of: exciting a specimen of a material for at least two nonzero wavenumbers (section 0056); measuring transfer function data subsequent to the excitation of said specimen for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); calculating said transfer function data to closed form subsequent to said measuring step said specimen for said excitation for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); and determining an estimated complex shear wavespeed of the material from said transfer function data calculated to closed form subsequent to said measuring step of said specimen for said excitation for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); obtaining a complex shear modulus of the material from said complex determined shear wavespeed (sections 0075-0077); determining a complex Young's modulus of the material from said obtained shear modulus (sections 0023, 0076 and 0114); and obtaining an estimated Poisson's ratio of the material from said determined Young's modulus and said obtained shear modulus (sections 0023, 0076 and 0114).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the teaching of Zeroug et al. in the invention of Lu et al. in order to determine the shear strength and the linear elastic parameters of said material as an important mechanical property from knowledge of the velocity of propagation of the compressional and shear acoustic waves inside said material (Zeroug et al., section 0003).
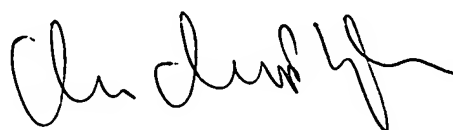
Contact Information

5.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuqin Sun whose telephone number is (571)272-2280. The examiner can normally be reached on 6:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571)272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Xiuqin Sun
Examiner
Art Unit 2863

XS *XS*
November 6, 2004

MICHAEL NGHIEM
PRIMARY EXAMINER